WHAT IS CLAIMED IS:

1. A method of monitoring input light having a plurality of spectral bands, the method comprising:

during a first time interval,

separating a first spectral band of the plurality of spectral bands from the plurality of spectral bands,

directing the first spectral band to a photodetector while preventing the spectral bands in the plurality of spectral bands other than the first spectral band from reaching the photodetector, and

generating, with a wavelength-monitoring circuit that is coupled to the photodetector, a first signal representing a quality characteristic of a modulated or unmodulated pattern of light in the first spectral band; and

thereafter, during a second time interval,

separating a second spectral band of the plurality of spectral bands from the plurality of spectral bands,

directing the second spectral band to the photodetector while preventing spectral bands in the plurality of spectral bands other than the second spectral band from reaching the photodetector, and

generating, with the wavelength-monitoring circuit, a second signal representing a quality characteristic of a modulated or unmodulated pattern of light in the second spectral band.

2. The method of claim 1, and further comprising, during the first time interval, generating a first power signal representing combined optical power of the spectral bands other than the first spectral band.

3. The method of claim 1, and further comprising:

during subsequent successive time intervals,

separating each spectral band of the plurality of spectral bands from the plurality of spectral bands,

directing the separated spectral band to the photodetector while preventing the spectral bands other than the separated spectral band from reaching the photodetector, and

generating, with the wavelength-monitoring circuit, a signal representing a quality characteristic of a modulated or unmodulated pattern of light in the separated spectral band.

4. The method of claim 1, wherein the first and second signals represent, for the first and second spectral bands, one or more of signal-to-noise ratio, bit error rate, optical power level, and optical wavelength center frequency.

5. The method of claim 1, wherein:

the modulation pattern implements SONET STS-1 frames; and

the first and second signals represent specific bytes in the SONET frames.

6. Apparatus for monitoring input light having a plurality of spectral bands, the apparatus comprising:

an optical train that intercepts the input light and provides optical paths for routing the spectral bands;

a photodetector;

a routing mechanism that operates to direct selected spectral bands to said photodetector;

an electrical circuit coupled to said photodetector to provide a signal representing a quality characteristic of a modulated or unmodulated pattern of light impinging on said photodetector; and

a control circuit coupled to said routing mechanism to cause different selected spectral bands to said photodetector, whereby said electrical circuit provides signals representing the quality characteristic for the different selected spectral bands.

7. The apparatus of claim 6, wherein said electrical circuit provides a signal representing, for each selected spectral band, one or more of signal-to-noise ratio, bit error rate, optical power level, and optical wavelength center frequency.

8. The apparatus of claim 6, wherein:

said modulation pattern implements SONET STS-1 frames; and

said electrical circuit provides a signal representing specific bytes in the SONET frames.

9. The apparatus of claim 6, wherein

said control circuit sequentially causes said routing mechanism to select each of the plurality of spectral bands so that the plurality of spectral bands are sequentially communicated to said photodetector in a round-robin fashion.

10. The apparatus of claim 6, wherein:

said routing mechanism includes a plurality of dynamically configurable routing elements corresponding to the plurality of spectral bands, each routing element having first and second states, said first state causing that routing element to direct its respective spectral band to said photodetector, said second state causing that routing element to direct its respective spectral band so as not to reach said photodetector; and

said control circuit sequentially selects each routing element in a desired subset of the plurality of routing elements so that the corresponding subset of spectral bands are sequentially communicated to said photodetector in a round-robin fashion, whereupon the spectral bands in said subset of spectral bands are monitored for quality by said electrical circuit and spectral bands not in said subset are not monitored for quality by said electrical circuit.

11. The apparatus of claim 10, wherein:

said second state of each of said routing elements causes that routing element to direct its respective spectral band to a common location.

12. The apparatus of claim 11, and further comprising an additional photodetector that generates a signal representing optical power of light impinging on said common location.

13. The apparatus of claim 6, wherein said optical train includes a dispersive element.

14. The apparatus of claim 10, wherein at least one of said dynamically configurable elements is a rooftop prism whose position can be changed to define said first and second states.

15. The apparatus of claim 10, wherein at least one of said dynamically configurable elements includes a mirror whose orientation can be changed to define said first and second states.

16. The apparatus of claim 12, further comprising an additional electrical circuit that is connected to said additional photodetector and computes the total optical power incident on said additional photodetector and sets a threshold for triggering a fault condition if said optical power falls below said threshold.

17. The apparatus of claim 6, incorporated into a system that further includes:

a coupler that directs a fraction of light traveling on a fiber to be monitored to said optical train; and

a management processor that receives information based on said signal representing a quality characteristic.

18. Apparatus for monitoring at least one characteristic of input light having a plurality of spectral bands, the apparatus comprising:

an optical train that intercepts the input light and provides optical paths for routing the spectral bands;

first and second photodetectors;

a plurality of dynamically configurable routing elements corresponding to the plurality of spectral bands, each routing element having first and second states, said first state causing that routing element to direct its respective spectral band to said first photodetector, said second state causing that routing element to direct its respective spectral band to said second photodetector;

a first electrical circuit coupled to said first photodetector to provide a signal representing a quality characteristic of a modulated or unmodulated pattern of light impinging on said first photodetector;

a second electrical circuit coupled to said second photodetector to provide a signal representing optical power of light impinging on said second photodetector; and

a control circuit coupled to said routing elements to cause different selected ones of said routing elements to assume said first state while causing the remaining routing elements to assume said second state.

19. The apparatus of claim 18, wherein said first electrical circuit provides a signal representing, for each selected spectral band, one or more of signal-to-noise ratio, bit error rate, optical power level, and optical wavelength center frequency.

20. The apparatus of claim 18, wherein said control circuit sequentially selects each routing element in the plurality of routing elements so that the plurality of spectral bands are sequentially communicated to said first photodetector in a round-robin fashion.

21. The apparatus of claim 18, wherein said control circuit sequentially selects each routing element in a desired subset of the plurality of routing elements so that the corresponding subset of spectral bands are sequentially communicated to said first photodetector in a round-robin fashion, whereupon said subset of spectral bands are monitored for quality by said first electrical circuit and spectral bands not in said subset are not monitored for quality by said first electrical circuit.

22. The apparatus of claim 18, wherein said first photodetector is a PIN photodiode or an avalanche photodiode.

23. The apparatus of claim 18, wherein said optical train includes a dispersive element.

24. The apparatus of claim 18, wherein at least one of said dynamically configurable elements is a rooftop prism whose position can be changed to define said first and second states.

25. The apparatus of claim 18, wherein each of said dynamically configurable elements includes a mirror whose orientation can be changed to define said first and second states.

26. The apparatus of claim 18, wherein said second electrical circuit connected to said second photodetector computes the total optical power incident on said photodetector and sets a threshold for triggering a fault condition if said optical power falls below said threshold.

27. The apparatus of claim 20, in a system that further includes:

a coupler that directs a fraction of light traveling on a fiber to be monitored to said optical train; and

a management processor that receives information based on said signal representing a quality characteristic.